

SEMINAR



SERIES

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力学与工程科学系

湍流与复杂系统国家重点实验室

Hydrodynamic simulations of microswimmers

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地 点: 北京大学新奥工学大楼 2047



内容简介:

In this talk I will describe our recent simulation efforts to understand the collective motion of small micrometer sized active particles suspended in a liquid environment. Specifically, I will concentrate on the effects of chirality in these systems. This concerns two specific examples. In the first part, we study collective motion in bulk suspensions of spherical microswimmers with chiral trajectories. Using a generic model, we demonstrate that both circular and helical swimmers can synchronise their rotation. In the second part, we study achiral swimmers in 3-dimensional nematic liquid crystals, We observe a spontaneous chiral symmetry breaking, where the initially uniform nematic state is kneaded into a continuously twisting state akin to cholesteric liquid crystal. This transition has a hydrodynamic origin and corresponds to a twist-bend instability of the nematic order. Finally, I will present a few results concerning cargo transport using nematic disclinations.

报告人简介:

Dr. Juho Lintuvuori is currently a permanent CNRS researcher in the LOMA laboratory at the university of Bordeaux. He obtained a master degree from University of Helsinki in 2006 in his native Finland, followed by PhD from University of Durham UK in 2009. After a postdoc stay in the University of Edinburgh and Marie Curie fellowship in LPS Orsay, he took his current post as CNRS researcher in Bordeaux 2016. His general research interest includes large-scale simulations of flowing soft materials, such as liquid crystals, microswimmers and colloidal fluids.

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